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EXAMINER	
RINEHART, KENNETH	

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3743	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/797,272	HIGGINS, BRIAN S.	
	Examiner	Art Unit	
	KENNETH B. RINEHART	3743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 4/15/09 have been fully considered but they are not persuasive. Regarding the examples illustrated in the specification, the examples do not provide sufficient detail as to enable one of ordinary skill to practive the invention. For example in the example discussed in the applicant's arguments there is no discussion of microstaging much less the setting for the multitude of other variables during the operation of the invention. Again those variables discussed are often dealing with the end result such as ppm. The specification lists 7 parameters to increase the residence time and 4 parameters to increase the reducing potential in the flue gases. The specification has few details as to what values these parameters should be in order to enable the invention. Consequently the specification is not enabling as undue experimentation would be required. Regarding the SO3 levels, the applicant does provide these levels, however, these levels are merely the end result of the method and does not inform one of ordinary skill how the result is accomplished. The test data on page 13 refer to the "results that can be achieved" and the "effects" which are not enabling as it merely informs one of the end state and not how it was achieved. In response to applicant's argument that Wright is directed to the burning of low sulfur coal, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Moreover, In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the

rejections are based on combinations of references. Regarding the applicant's arguments concerning Carver et al the reference reads on the broad claim limitation when read in light of the specification. On page 13 of the specification there are 7 parameters to increase the residence time and 4 parameters to increase the reducing potential in the flue gases and the carver reference clearly incorporates active adjustments to achieve low levels of SOX. The various ranges and desired low values illustrate the active adjustment just as precisely as the applicant's specification. Regarding the motivation to combine, the proper motivation has been provided as illustrated in the rejection.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-24 are provisionally rejected on the ground of nonstatutory double patenting over claims 17-33 of copending Application No. 10797513. Although the conflicting claims are

not identical, they are not patentably distinct from each other because it would be obvious to one of ordinary skill dew point temperature is effected by the sulfur trioxide concentration.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1-25 are rejected on the ground of nonstatutory double patenting over claims 1-25 of U. S. Patent No. 7537743 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: a method for controlling SO3 with micro and macro staging.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims refer to "actively adjusting the reducing environment such that S03 is reduced to S02 to effectuate an overall decrease in SO3 concentration prior to selective catalytic reduction to achieve a desirable level of S03 for optimizing precipitator function; actively adjusting the reducing environment such that S03 is reduced to S02 to effectuate an overall decrease in SO3 concnetration and achieve a desirable level of S03 for optimizing precipitator function; actively adjusting the reducing environment time period such that S03 is preferentially reduced to S02 to achieve a desirable level of S03 for optimizing precipitator function; which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 1 refers to actively adjusting the reducing environment such that SO3 is reduced to SO2 to effectuate an overall decrease in SO3 concentration prior to selective catalytic reduction to achieve a desirable level of SO3 for optimizing precipitator function" which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly

connected, to make and/or use the invention. Claim 9 refers to "actively adjusting the reducing environment such that SO3 is reduced to SO2 to effectuate an overall decrease in SO3 concentration achieve a desirable level of SO3 for optimizing precipitator function" which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 17 refers to "actively adjusting the reducing environment time period such that SO3 is preferentially reduced to SO2 to achieve a desirable level of SO3 for optimizing precipitator function" which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,375,949 to Salooja ("Salooja") in view of U.S. Patent No. 4,029,752 to Cahn ("Cahn"), and applicant's admitted prior art, and further in view of U.S. Patent No. 4,196,057 to May ("May") (previously cited) and Altman (5,011,516).

Salooja discloses in the specification and figures 1-10 an invention in the same field of endeavor as applicant's invention and similar to that described in applicant's claims 1-24.

In particular, in regard to at least claim 1, Salooja discloses a method of reducing the acidity (each of nitrogen oxides and sulfur trioxides, see cols. 5-7) comprising the steps of:

c) partially combusting the fuel in a first stage to create a reducing environment (see at least col. 1, lines 50-54);

d) actively adjusting the reducing environment such that SO3 is reduced to SO2 to effectuate an overall decrease in SO3 concentration to achieve a desirable level of SO3 (see at least col. 1, lines 54-59 and col. 7 lines 5- 20describing that the nitrogen oxides and sulfur tri-oxides are controlled to desired/predetermined levels);

e) combusting the remainder of the fuel and combustion intermediates in a second stage with oxidizing environment; thereby controlling levels of SO3 in the flue gases (see at least col. 1, lines 60-63 and lines 29-33).

Cahn teaches a method of reducing sulfur oxides that is considered to be in the same field of endeavor as both applicant's invention and Salooja. Cahn describes that sulfur oxides in a process gas stream are reduced by reaction with ammonia (i.e. NH3) as a reducing agent (see at least col. 7, lines 48-52). Cahn clearly provides that sulfur trioxide is reduced in the same manner as the described processes for sulfur dioxide (see at least col. 7, lines 34-38). The examiner notes that at least ammonia (NH3) is considered to be the type of reducing radical described in applicant's specification (see specification p. 9, line 14 lists NHi). Further, the examiner also notes that Cahn also suggests that other reducing agents such as H2, CO, and CH4 (also listed in applicant's specification) are recognized in the art as reducing radicals creating a reducing environment (see

Cahn, col. 7, lines 65-68). This describes process of employing either ammonia or other above noted agent to result in the reduction of sulfur trioxide (a reducible acid) is considered to suggest the reduction by election addition described in applicant's specification and claimed in claim 17. Returning to Salooja, while this reference provides only some detail of the reducing of sulfur trioxides through the practice of the described method, there is clear suggestion that the reduction of sulfur trioxides is recognized in the art. Accordingly, a person of ordinary skill in the art at the time the invention was made would desirably modify the process in Salooja to incorporate the reduction by electron addition suggested by Cahn to desirably produce a gas stream that has "little or no" sulfur trioxide (see at least Cahn, col. 8, lines 41-46).

Regarding the limitations of utilizing SCR system, applicant discloses in the specification that "an SCR is often only intended to be used for six months per year", and "are bypassed during the winter". This is regarded as an admission of prior art.

Salooja, Cahn, and applicant's admitted prior art teach substantially all of the limitations of the methods recited in claims1-24 with exception of the steps of actively adjusting the reducing environment (claims 1 and 9 and 17), improving ESP function (claims 1 and 9 and 17), These additional steps have not been identified in Salooja, Cahn, and applicant's admitted prior art. However, In regard to claims 1 and 9 and 17, the acid of concentration of the flue gas is directly related to the acid dew point temperature of the flue gas. This is expressly noted by applicant in applicant's description of the prior art, namely "...as the SO3 concentration increases, the acid dew point temperature of the flue gas increases." (see applicant's specification, p. 1, lines 16-18). To further support this assertion the examiner also points to May. May discloses a method which

provides that "[m]easurement of dew point enables a semi-quantitative determination of the sulfur trioxide concentration in the exhaust or flue gas" (see May, col. 5, lines 30-32 and 38- 42). Accordingly, a person of ordinary skill in the art would understand that reduction of the acid concentration of the flue gas necessarily results in the lowering of the acid dew point level of the flue gas. As noted above, Salooja provides for the reduction of sulfur oxides from the effluent of flue gas of a furnace to a desired level (see at least col. 1, lines 54-59 and cols. 5-7). Therefore, a person of ordinary skill in the art would reasonably understand that obtaining the reduction target of the oxides in the flue gas as specified in Salooja would necessarily result in a corresponding desired dew point level (again see at least May, col. 5, lines 38-42).

Also in regard to claims 1 and 9 and 17, it is unclear whether the Salooja apparatus includes an ESP device. However, Altman teaches that fly ash is conventionally removed from combustion gases by electrostatic precipitation (col. 1, lines 7-10). Altman also teaches that the concentration of sulfur trioxide must be controlled to optimize the performance of the ESP filter (col. 1, lines 17-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Salooja apparatus to include the ESP device, as Altman teaches they are conventionally used to control fly ash (col. 1, lines 7-10).

Accordingly, a person of ordinary skill in the art would understand that reduction of the acid concentration of the flue gas necessarily results in optimizing the performance of an ESP device. As noted above, Salooja provides for the reduction of sulfur oxides from the effluent of flue gas of a furnace to a desired level (see at least col. 1, lines 54-59 and cols. 5-7). Therefore, a person of ordinary skill in the art would reasonably understand that obtaining the reduction target of the

oxides in the flue gas as specified in Salooja would necessarily result in a corresponding improved performance of the ESP device (again see at least Altman, col. 1, lines 17-21).

In regard to at least claim2 and 3, Salooja describes that a catalytic burner is supplied at least in the first stage that produces lower NOx production than conventional combustion systems (see at least col. 2, lines 7-12, col. 6, line 67 through col. 7, line 4 and col. 4, lines 31-47) and thus reasonably suggests micro-staging through the use of Iow-NOx burners.

In further regard to claims 2 and 3, as noted above, while the examiner considers that the operation of the catalytic burners suggests the recited micro-staging using low NOX burners, even if this is not a proper understanding, the examiner notes that applicant admits that the use of micro-staging using Iow-NOx burners to reduce emissions in combustion furnaces is known in the art (see admitted prior art of page 5, lines 4-18 of applications' specification). Accordingly, even if the operation of the catalytic burners of Salooja are not properly considered to be applicant's recited micro- staging using low NOx burners, a person of ordinary skill in the art would desirably seek to incorporate mircro-staging using low NOx burners in the process of Salooja in order to desirably aid in reducing NOx emissions (see admitted prior art of p. 5, lines 4-18 of applications' specification).

In regard to at least claims 4-8 and10-15, 18-23 , applicant also admits that the use of macro-staging using over-fired air and used in combination with micro-staging using low NOx burners is known in the art (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification). Accordingly, a person of ordinary skill in the art would seek to employ macro-staging using over-fired air in a combustion stage and/or in combination of micro-staging using low NOx burners to desirably achieve NOx emissions reduction (see admitted prior

art of page 5, line 19 through page 6, line 5 of applications' specification). Regarding claims 8, 16 and 24 Salooja teaches burning a "carbonaceous fuel", which is considered to suggest coal.

Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kindig (4824441) in view of Wright (5,032,154) and Carver (4381718) and applicant's admitted prior art. Kindig discloses a) partially combusting the fuel in a first stage to create a reducing environment (col. 10, lines 51-54), b) adjusting the reducing environment such that SO3 is reduced to SO2 to achieve a desirable level of SO3 …; (col. 13, lines 8-23, SO3 and SO2 are inherently produced during combustion, and reduction is inherently occurring.), c) combusting the remainder of the fuel and combustion intermediates in a second stage with oxidizing environment, combusting the remainder of the fuel in an oxidizing environment (col. 10, lines 43-47), thereby controlling the levels of SO3 in the flue gases, reducing the conversion of levels of SO3 in the flue gases , thereby controlling the levels of SO3 in the flue gases (col. 13, lines 20-22), micro-staging the first stage fuel combustion , the micro-staging is provided through the use of low-Nox burners (col. 12, line 43), macro-staging the first stage of fuel combustion, the macro-staging is provided through the use of over-fired air (col. 10, lines 46), including a combination of micro-staging and macro-staging (col. 12, line 43, col. 10, line 46), the micro-staging is provided by low-Nox burners and the macro-staging is provided by over-fired air (col. 12, line 43, col. 10, line 46), the fuel is coal (col. 1, line 16). Kindig discloses applicant's invention substantially as claimed with the exception of for optimizing precipitator function. Wright teaches for optimizing precipitator function (col. 1, lines 27-61) for the purpose of meeting clean air requirements. It would have been obvious to one of ordinary skill in the art to modify Kindig by including for optimizing

precipitator function as taught by Wright for the purpose of meeting clean air requirements. Carver et al teaches actively adjusting, effectuate an overall decrease in SO3 concentration (abstract, figs.) for the purpose of meeting environmental regulations. It would have been obvious to one of ordinary skill in the art to modify Kindig by including actively adjusting, effectuate an overall decrease in SO3 concentration as taught by Carver for the purpose of meeting environmental regulations. The applicant is combining prior art elements according to known methods to yield predictable results.

In further regard to claims 10 and 11, as noted above, while the examiner considers that the operation of the catalytic burners suggests the recited micro-staging using low NOX burners, even if this is not a proper understanding, the examiner notes that applicant admits that the use of micro-staging using Iow-NOx burners to reduce emissions in combustion furnaces is known in the art (see admitted prior art of page 5, lines 4-18 of applications' specification). Accordingly, even if the operation of the catalytic burners of Salooja are not properly considered to be applicant's recited micro- staging using low NOx burners, a person of ordinary skill in the art would desirably seek to incorporate mircro-staging using low NOx burners in the process of Salooja in order to desirably aid in reducing NOx emissions (see admitted prior art of p. 5, lines 4-18 of applications' specification) and to adjust.

In regard to at least claims 12-15, applicant also admits that the use of macro-staging using over-fired air and used in combination with micro-staging using low NOx burners is known in the art (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification). Accordingly, a person of ordinary skill in the art would seek to employ macro-staging using over-fired air in a combustion stage and/or in combination of micro-staging using low NOx

burners to desirably achieve NOx emissions reduction (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification) and to adjust.

Claims 1-3, 4-8, 9-15, 16, 17-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carver et al (4381718) in view of Fan (2004/0120872) and Wright (5,032,154) and applicant's admitted prior art. Carver discloses partially combusting the fuel in a first stage to create a reducing environment (1, fig. 1), b) actively adjusting the reducing environment such that SO3 is reduced to SO2 to effectuate an overall decrease in SO3 concentration prior to … to achieve a desirable level of SO3; (2 to 3, SO3 and SO2 are inherently produced during combustion, and reduction is inherently occurring, residence time adjusted prior to lean stage,Abstract, figs.), c) combusting the remainder of the fuel and combustion intermediates in a second stage with oxidizing environment, combusting the remainder of the fuel in an oxidizing environment, thereby controlling the levels of SO3 in the flue gases, reducing the conversion of levels of SO3 in the flue gases , thereby controlling the levels of SO3 in the flue gases (4, fig. 1) , micro-staging the first stage fuel combustion , the micro-staging is provided through the use of low-Nox burners (col. 5, line 23), the fuel is coal (fig. 1). Carver discloses applicant's invention substantially as claimed with the exception of selective catalytic reduction, for optimizing precipitator function. Fan teaches selective catalytic reduction (44, fig. 1) for the purpose of reducing emissions. It would have been obvious to one of ordinary skill in the art to modify Carver et al by including selective catalytic reduction as taught by Fan for the purpose of reducing emissions to meet environmental requirements. Carver in view of Fan discloses applicant's invention substantially as claimed with the exception of for optimizing precipitator function. Wright teaches for optimizing precipitator function (col. 1, lines 27-61) for the purpose

of meeting clean air requirements. It would have been obvious to one of ordinary skill in the art to modify Carver by including for optimizing precipitator function as taught by Wright for the purpose of meeting clean air requirements.

In further regard to claims 2, 3,10 11, 18 and 19 as noted above, while the examiner considers that the operation of the catalytic burners suggests the recited micro-staging using low NOX burners, even if this is not a proper understanding, the examiner notes that applicant admits that the use of micro-staging using low-NOx burners to reduce emissions in combustion furnaces is known in the art (see admitted prior art of page 5, lines 4-18 of applications' specification). Accordingly, even if the operation of the catalytic burners of Salooja are not properly considered to be applicant's recited micro- staging using low NOx burners, a person of ordinary skill in the art would desirably seek to incorporate mircro-staging using low NOx burners in the process of Salooja in order to desirably aid in reducing NOx emissions (see admitted prior art of p. 5, lines 4-18 of applications' specification) and to adjust.

In regard to at least claims 4-7, 12-15, 20-23 applicant also admits that the use of macro-staging using over-fired air and used in combination with micro-staging using low NOx burners is known in the art (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification). Accordingly, a person of ordinary skill in the art would seek to employ macro-staging using over-fired air in a combustion stage and/or in combination of micro-staging using low NOx burners to desirably achieve NOx emissions reduction (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification) and to adjust.

Claims 4-7, 12-15, 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carver et al (4381718) in view of Fan (2004/0120872) and applicant's admitted prior art as applied to claim 1,9,17 above, respectively, and further in view of Kindig (4824441). Carver et al (4381718) in view of Fan (2004/0120872) discloses applicant's invention substantially as claimed with the exception of macro-staging the first stage of fuel combustion, the macro-staging is provided through the use of over-fired air, including a combination of micro-staging and macro-staging, the micro-staging is provided by low-Nox burners and the macro-staging is provided by over-fired air. Kindig teaches macro-staging the first stage of fuel combustion, the macro-staging is provided through the use of over-fired air (col. 10, lines 46), including a combination of micro-staging and macro-staging (col. 12, line 43, col. 10, line 46), the micro-staging is provided by low-Nox burners and the macro-staging is provided by over-fired air (col. 12, line 43, col. 10, line 46) for the purpose of reducing emissions. It would have been obvious to one of ordinary skill in the art to modify Carver by including macro-staging the first stage of fuel combustion, the macro-staging is provided through the use of over-fired air, including a combination of micro-staging and macro-staging, the micro-staging is provided by low-Nox burners and the macro-staging is provided by over-fired air as taught by Kindig for the purpose of reducing emissions so that environmental regulations are met.

In further regard to claims 2, 3,10 11, 18 and 19 as noted above, while the examiner considers that the operation of the catalytic burners suggests the recited micro-staging using low NOX burners, even if this is not a proper understanding, the examiner notes that applicant admits that the use of micro-staging using low-NOx burners to reduce emissions in combustion furnaces is known in the art (see admitted prior art of page 5, lines 4-18 of applications' specification).

Accordingly, even if the operation of the catalytic burners of Salooja are not properly considered to be applicant's recited micro- staging using low NOx burners, a person of ordinary skill in the art would desirably seek to incorporate mircro-staging using low NOx burners in the process of Salooja in order to desirably aid in reducing NOx emissions (see admitted prior art of p. 5, lines 4-18 of applications' specification) and to adjust.

In regard to at least claims 4-7, 12-15, 20-23 applicant also admits that the use of macro-staging using over-fired air and used in combination with micro-staging using low NOx burners is known in the art (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification). Accordingly, a person of ordinary skill in the art would seek to employ macro-staging using over-fired air in a combustion stage and/or in combination of micro-staging using low NOx burners to desirably achieve NOx emissions reduction (see admitted prior art of page 5, line 19 through page 6, line 5 of applications' specification) and to adjust.

Conclusion

Any inquiry concerning this communication should be directed to KENNETH B. RINEHART at telephone number (571)272-4881.

/Kenneth B Rinehart/

Supervisory Patent Examiner, Art Unit 3743